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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/000,229	11/30/2001	Rajen Dias	42390P12897	9231

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EXAMINER
PHAM, HOAI V

ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 09/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/000,229	DIAS ET AL.	
	Examiner	Art Unit	
	Hoai V Pham	2814	

-- Th MAILING DATE of this communication app ars on the cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) *15-28* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 3-6, and 8-11are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

- Claims 1 and 8, the limitation of "at least one trench sidewall is substantially planar to the at least one channel sidewall" is not enabled. The specification on page 9 and figures 5-6, while disclosing that the trench sidewalls 124 and 124' are substantially parallel to the dice channel sidewalls 140 and 140', does not enable for those skilled in the art to have claimed microelectronic device having "at least one trench sidewall is substantially planar to the at least one channel sidewall". See specification on page 9 and lines 2-6 that discloses the width 136 of the trench 122 is greater than the width 138 of the die channel 134 to form a lips 142 and 142'. It is not clear how the trench sidewalls 124 and 124'

can be substantially planar (lying on the same plane) to the die channel sidewalls 140 and 140' (see figures 5-6 for details).

- Dependent claims 3-6 and 9-11are also unclear because they respectively depend on independent claim 1 and dependent claim 8.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 5, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Kosaki et al. [U.S. Pat. 6,008,537] previously applied.

With respect to claim 1, Kosaki et al. (figs. 3A-3K, cols. 1-2) discloses a microelectronic device, comprising:

a microelectronic die (1) having an active surface, a back surface, and at least one side (see fig. 3C);

the at least one microelectronic die side comprising at least one trench sidewall (groove 33), at least one lip and at least one channel sidewall (groove 3) (see fig. 3E); and

a metallization layer (7) disposed on the microelectronic die back surface and the at least one trench sidewall (see fig. 3F).

With respect to claim 5, Kosaki et al. discloses that the at least one lip is substantially curved to at least one of the at least one trench sidewall and at least one channel sidewall (fig. 3F).

With respect to claim 6, Kosaki et al. discloses that the metallization layer is at least one metal selected from the group consisting of gold, silver, titanium, chromium, vanadium, tungsten, and nickel (col. 4, lines 31-34).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 3, 4, 7, and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaki et al. [U.S. Pat. 6,008,537] previously applied, in view of Applicant Admitted Prior Art (figs. 13-14).

With respect to claim 7, Kosaki et al. (figs. 3A-3K, cols. 1-2) discloses a microelectronic device, comprising:

a microelectronic die (1) having an active surface, a back surface, and at least one side (see fig. 3C);

the at least one microelectronic die side comprising at least one trench sidewall (groove 33), at least one lip and at least one channel sidewall (groove 3) (see fig. 3E); and

a metallization layer (7) disposed on the microelectronic die back surface and the at least one trench sidewall (see fig. 3F); and

a heat dissipation device (8) attached to the microelectronic die back surface (see fig. 3H).

Kosaki et al. fails to disclose that a thermal interface material is between the heat dissipation device and the microelectronic die back surface. However, Applicant Admitted Prior Art shows that the thermal interface material (234) is between the heat dissipation device and the microelectronic die back surface (pp. 2-3). Therefore, it would have been obvious to the skilled in the art to apply the thermal interface material as taught by Applicant Admitted Prior Art into the device of Kosaki et al. in order to adhere the heat dissipation device to the microelectronic die back surface.

With respect to claim 11, Kosaki et al. discloses that the at least one lip is substantially curved to at least one of the at least one trench sidewall and at least one channel sidewall (fig. 3K).

With respect to claim 12, Kosaki et al. discloses that the metallization layer is at least one metal selected from the group consisting of gold, silver, titanium, chromium, vanadium, tungsten, and nickel (col. 4, lines 31-34).

With respect to claim 13, Applicant Admitted Prior Art discloses that the thermal interface material (234) is selected from the group consisting of lead, tin, indium, silver, 3 copper, and alloys thereof (page 2, lines 23-24).

With respect to claim 14, Applicant Admitted Prior Art discloses that the at least a portion of a fillet of the thermal interface material extend from the metallization layer on the microelectronic die to the heat dissipation device (fig. 14).

With respect to claim 3, 4, 9 and 10, Kosaki et al. does not teach exactly the shape of the lip as claimed by Applicant. However, the shape, size, dimension differences are considered obvious design choices and are not patentable unless unobvious or unexpected results are obtained from these changes. It appears that these changes produce no functional differences and therefore would have been

obvious. A change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1995).

Response to Arguments

8. Applicant's arguments filed 6/30/03 have been fully considered but they are not persuasive.

9. Applicant argues that it is not obvious to combine the thermal interface material of Applicant Admitted Prior Art to Kosaki device because PHS layer of Kosaki is inherently attach the plated feeder layer 7 thus there is no motivation to use the thermal interface material between the PHS layer and the plated feeder layer. The argument is not persuasive because Applicant Admitted Prior Art clearly discloses that the thermal interface material (234) is between the heat dissipation device and the microelectronic die back surface in order to adhere the heat dissipation device to the microelectronic die back surface (pp. 2-3). Therefore, it would have been obvious to modify the microelectronic device of Kosaki by forming the thermal interface material between the PHS layer and the plated feeder layer with the structure as set forth above because according to Applicant Admitted Prior Art, such thermal interface material would provide better adhesion the PHS layer to the plated feeder.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was

within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai V Pham whose telephone number is 703-308-6173. The examiner can normally be reached on 6:30A.M. - 6:00P.M..

11. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

12. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Hoai Pham
September 22, 2003